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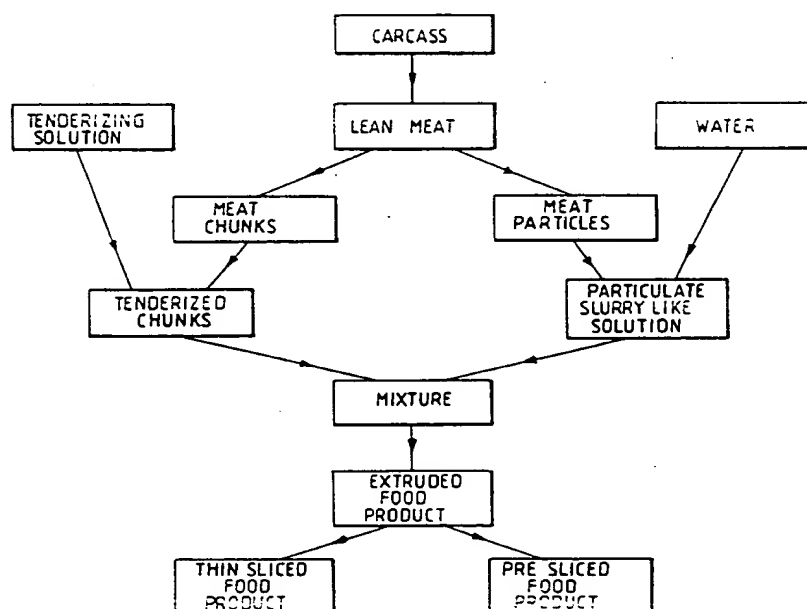
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(54) Processed meat product

(57) A food product is manufactured by combining substantially boneless meat in chunks with a slurry comprising meat in particles not more than 5 mm size and between 30% and 60% water, forming the resultant mass into a shape and rapidly freezing it. The meat chunks may be first tenderized by enzyme injections. The mass may be extruded and formed into any product from thin, flat beefburger-like products to large relatively thick joint-like products. A frozen product can be sliced and reassembled but, during cooking, the product does not revert to its pre-processed state but remains as a joint which can, when required, be separated into slices readily.



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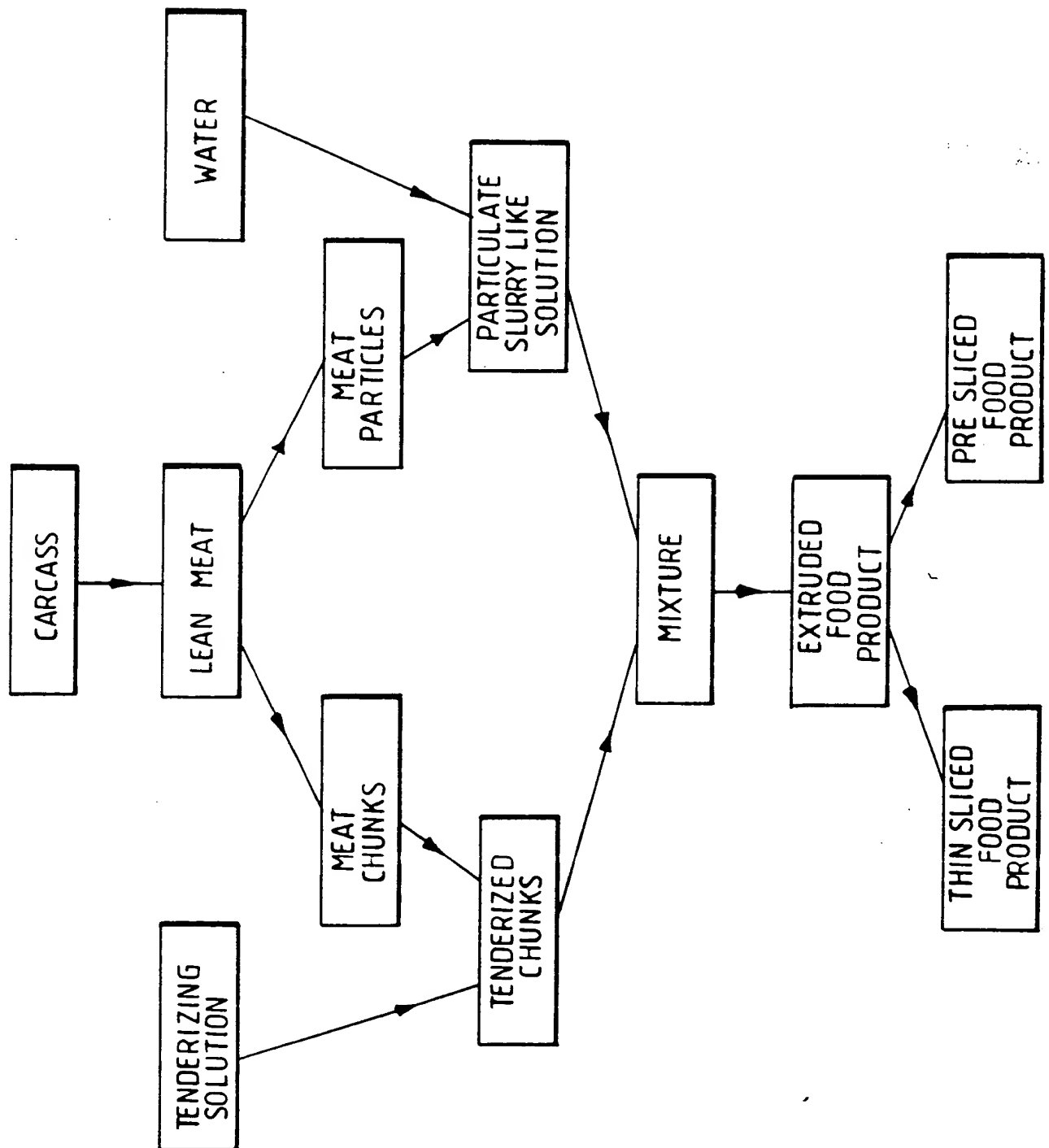
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PROCESSED MEAT PRODUCT

This invention relates to a method of processing meat and to a processed meat product produced by that method.

5 A bovine carcass incorporates a number of top quality muscles (which when trimmed from the carcass are known as primal cuts), a greater number of lower quality muscles and a large amount of partially inedible matter (hair, fat, gristle, bone).

10 The carcass may be trimmed so as to separate the top quality muscles into a plurality of individual steaks, the lower quality muscles into a mass of individual muscles and muscle parts, and the waste-like matter into inedible (hair, gristle, bone) and consumable (fat) portions.

15 The top quality steaks may then be offered for sale individually, whereas the lower quality muscles and/or fat may be processed into particulate meat products (such as beefburgers or sausages).

20 Such particulate meat products are often manufactured by cutting the muscles into particles the diameter of which is less than approximately 5mm, mixing the particulate mass with one or more chemical additives which act on the particles so as to bind them together, and forming the mixture into a settable shape.

25 These products are sometimes referred to as mechanically reclaimed meat products. Pure reclaimed meats suffer from at least two disadvantages: firstly, their appearance has a tendency to change from being relatively appetizing to relatively unappetizing; and,

30 secondly, they often incorporate meat which, when on the carcass, was adjacent to a bone. It will be appreciated that during the rotting process of meat, harmful bacteria spread throughout the meat from the bone outwards. Reclaimed meat products quite often

35 incorporate one or more artificial colouring agents

together with a plurality of other additives in order that the appearance of the product and its keeping properties are improved.

5 Alternatively, the lower quality muscles can be processed so as to upgrade their quality. This, in effect, means adding an enzymic tenderizer so as to soften the lower quality muscles until their tenderness substantially matches that of the top quality steaks. One disadvantage of adding an enzymic tenderizer to a muscle is that different parts of the muscle can absorb the tenderizer at different rates, thus causing the tenderness to ~~be~~^{vary} throughout the muscle.

10 it is an object of the present invention to provide a method of manufacturing a meat product wherein few if any artificial substances need to be added to the meat.

15 It is a second object of the invention to provide a method wherein lower quality muscles can be economically processed into a particulate meat product which retains the use of artificial additives.

20 According to the present invention a method of manufacturing a food product comprises preparing a substantially boneless mass of meat into large chunks, cutting or chopping a proportion of the boneless meat into particles the size of which does not substantially exceed 5mm, forming the particles into a particulate water/meat fluid having between 30% and 60% by weight of water, blending the remaining meat with the particulate fluid, forming the resultant mass into a food product having a predetermined shape and rapidly freezing the food product so as aid shape retention.

25 30 The boneless meat may include fat and gristle but in a preferred embodiment the boneless meat is 100% lean visual, that is no fat can be seen with the naked eye.

35 The particulate water/meat fluid preferably comprises between 40% and 50% by weight of water. If the completed food product is to be formed into flat

relatively thin product then the particulate fluid preferably comprises approximately 40% by weight of water. If the completed food product is to be formed into a relatively thick product then the particulate fluid preferably comprises approximately 50% by weight of water.

In a preferred embodiment, the chunks of meat which are not pulverized into small particles may, prior to being blended with the fluid, be tenderized by means of enzymes. A liquid tenderizer, which is a mixture of a concentrate vegetable enzyme derivative and a base salt, may be injected into each chunk of meat so that the inject solution comprises between approximately 5% and 23% by weight of the injected meat.

Once the chunks of meat have been blended with the particulate fluid, the resultant mass may be forced through an opening so that the chunks of meat become torn and thereby improve the shape retaining properties of the complete product.

The blended mass of meat chunks and particulate fluid may be extruded into sleeves for freezing.

The frozen extruded food product may be sliced into relatively thin separate food-products, or layers which are then formed into a pre-sliced joint.

If the food product takes the form of a pre-sliced joint a layer of emulsified fat may be applied to at least part of the joint.

A method of manufacturing a meat product substantially in accordance will now be described by way of example only, with reference to the accompanying drawing, in which:-

5 Figure 1 is a block diagram of a somewhat simplified method of manufacturing a meat product.

Any type of meat may be used in this method, but meats which have been found to be especially suitable include beef, pork, lamb, gammon, and fowl.

10 If it is desired to purchase an entire carcass then it is necessary to trim the carcass so as to remove and discard inedible waste (skin, hair, bones, etc), to remove top quality muscles in the form of primal cuts (sirloin, rump, etc) for individual sale and remove the
15 mass of lower quality meat (often forequarter, etc) for processing. This lower quality meat consists of a plurality of muscles interspersed with varying amounts of fat and gristle. In order to efficiently trim this meat, it is split along the natural muscle seams to reveal the
20 fat and gristle. The fat and gristle is then easily removed and discarded. The remaining meat is commonly referred to as 100% lean visual because there are no areas of fat visible to the naked eye (although there may be very small pockets of fat within the muscle itself).

25 Alternatively, 100% lean visual meat may be purchased separately, thereby eliminating the step of trimming a carcass.

30 The lean meat is then graded for quality by accurately judging its age and texture. The purpose of this is to calculate the concentration of tenderizing solution which will need to be added later.

35 Approximately 90% of the lean meat is then injected with a concentrated tenderizing solution. Each similarly graded chunk of meat is accurately injected, by means of a multi-needle pump assembly with the solution

5 which consists of a mixture of a concentrate vegetable enzyme derivative and a base salt. The base salt assists in the spread of the enzyme throughout the meat. The poor quality grades of meat receive a greater concentration of the solution than the better grades in order that all the chunks have a substantially equal quality. Controlled pumping of the solution results in a weight uplift of between 10% and 20%. Ideally the range of the weight uplift should be between 10% and 15% with an average of approximately 12%.

10 The meat chunks injected with the tenderizing solution, is tumbled under vacuum to aid the spread of the enzyme throughout the meat and to help retain the solution in the muscle tissue.

15 Optimum results have been achieved by tumbling the meat for approximately 8 minutes, then a 5 minute rest period, and finally a further 8 minutes of tumbling. Once tumbling has been completed the batch of injected meat is weighed.

20 The remaining 10% of the lean meat is pulverised and mixed with water thus comprising a particulate water/meat slurry-like solution.

25 The cold dry lean meat is first diced into cubes having a dimension of approximately 5cm, and then quickly cold-cut into particles having a size of less than approximately 5mm by means of a variable speed bowl chopper.

30 If a thin flat beefburger-like product is envisaged then it is necessary to produce a particulate solution having approximately 40% by weight of water. Alternatively, if a large relatively thick joint-like product is envisaged it is necessary to produce a particulate solution having approximately 50% by weight of water.

35 The desired proportion of cold water is slowly added to the dry lean meat and the resultant mass mixed

until a viscous particulate water/meat fluid is achieved.

5 The particulate water/meat fluid is added to the tumbled meat chunks in the weight ratio 21:100. A mixer/grinder machine tumbles the meat chunks together with the particulate fluid so that the muscle strands are not damaged or cut.

10 Once mixed the resultant mixture is extruded through an opening in a die. The opening is bound by at least one rough edge so that as the cold mixture is forced through it, respective meat muscles strands are caught on the edges. The muscles are torn and that improves the shape retaining properties of the complete product.

15 The mixture is extruded into an elongate sleeve which is preferably quickly frozen thereafter, it is also possible to apply a layer of emulsified fat to at least part of the cold extrusion, and then to freeze the fat and the meat product together.

20 If a thin, flat beefburger-like product is required then the frozen extruded logs can be identically cut by means of a vertical cutting machine.

25 Alternatively, if a large relatively thick joint-like product is required then the frozen fat-coated logs can be identically sliced by the same machine and reassembled. Cooking tests have, shown that such a pre-sliced joint cooks substantially identically to a solid joint ((e.g. leg of lamb) and yet the slices of meat do not separate.

30 Surprisingly, the slices of meat of the pre-sliced joint do not revert to their pre-processed state during cooking but are readily separable once cooked.

Claims

1. A method of manufacturing a food product comprising preparing a substantially boneless mass of meat in large chunks, cutting or chopping a proportion of the boneless meat into particles the size of which does not substantially exceed 5 millimetres, forming the particles into a particulate water/meat fluid having between 30% and 60% by weight of water, blending the remaining meat with a particulate fluid, forming the resultant mass into a food product having a predetermined shape and rapidly freezing the food product so as to aid shape retention.
2. A method of manufacturing a food product according to Claim 1 wherein the boneless meat is 100% lean visual, that is to say that no fat can be seen with the naked eye.
3. A method of manufacturing a food product according to Claims 1 or 2 wherein the particulate water/meat fluid preferably comprises between 40% and 50% by weight of water.
4. A method of manufacturing a food product according to Claim 4 wherein, when the completed food product is to be formed into a flat relatively thin product, the particulate fluid comprises approximately 40% by weight of water.
5. A method of manufacturing a food product according to Claim 3 wherein, when the completed food product is to be formed into a relatively thick product, the particulate fluid comprises approximately 50% by weight of water.
6. A method of manufacturing a food product according to any preceding claim or claims wherein the chunks of meat which are not pulverised into small particles are tenderised by means of enzymes prior to being blended with the fluid.
7. A method of manufacturing a food product according to Claim 6 wherein a liquid tenderiser is injected into each chunk of meat so that the injected solution comprises between approximately 5% and 23% by

weight of the injected meat.

8. A method of manufacturing a food product according to Claim 7 wherein the liquid tenderiser is a mixture of a concentrate vegetable enzyme derivative and a base salt.

9. A method of manufacturing a food product according to any preceding claim or claims wherein once the chunks of meat have been blended with the particulate fluid, the resultant mass is forced through an opening so that the chunks of meat become torn and thereby improve the shape retaining properties of the complete product.

10. A method of manufacturing a food product according to any preceding claim or claims wherein the blended mass of meat chunks and particulate fluid are extruded into sleeves for freezing.

11. A method of manufacturing a food product according to a preceding claim or claims wherein a frozen extruded food product can be sliced into relatively thin separate food products, or into layers which can then be formed into a pre-sliced joint.

12. A method of manufacturing a food product according to any preceding claim or claims wherein, when the food product takes the form of a pre-sliced joint, a layer of emulsified fat is applied to at least part of the joint.

13. A food product comprising a mixture of tenderised lean meat chunks and a particulate slurry -like lean meat solution.

14. A food product according to Claim 13 when manufactured by the method set out in any one or more of Claims 1 to 12.

15. A method of manufacturing a food product substantially as hereinbefore described with reference to Figure 1 of the accompanying drawing.

16. A food product substantially as hereinbefore described with reference to Figure 1 of the accompanying drawing.

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